

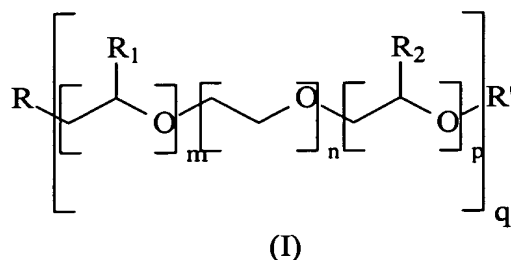
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## CLAIMS

1- The use of a water-soluble copolymer as agent improving the optical brightness, characterized in that said copolymer has at least one alkoxy or hydroxy polyalkylene glycol function grafted onto at least one ethylenically unsaturated monomer.

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2- The use of a water-soluble copolymer as agent improving the activation of optical brightness according to claim 1, characterized in that said copolymer consists of at least one monomer of formula (I):



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where

- m and p represent a number of alkylene oxide units less than or equal to 150,
- n represents a number of ethylene oxide units less than or equal to 150,
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- $R_1$  represents hydrogen or the methyl or ethyl radical,
- $R_2$  represents hydrogen or the methyl or ethyl radical,
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group

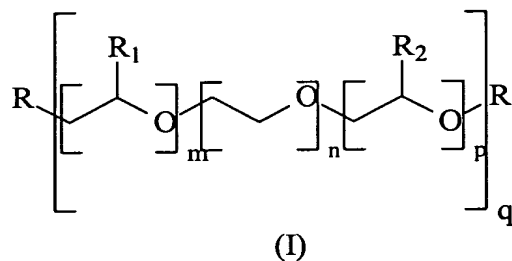
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of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,

- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,

3- The use of a water-soluble copolymer as agent improving the activation of optical brightness according to one of claims 1 or 2, characterized in that said copolymer consists of:

- a) at least one anionic monomer with a carboxylic or dicarboxylic or phosphoric or phosphonic or sulfonic function or a mixture thereof,
- b) at least one non-ionic monomer, the non-ionic monomer consisting of at least one monomer of formula (I):



where

- m and p represent a number of alkylene oxide units less than or equal to 150,
- n represents a number of ethylene oxide units less than or equal to 150,
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- R<sub>1</sub> represents hydrogen or the methyl or ethyl radical,
- R<sub>2</sub> represents hydrogen or the methyl or ethyl radical,
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$

dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,

- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several monomers of formula (I),

- c) possibly, at least one monomer of the acrylamide or methacrylamide type or their derivatives such as N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, and mixtures thereof, or at least one non water-soluble monomer such as the alkyl acrylates or methacrylates, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, vinyls such as vinyl acetate, vinylpyrrolidone, styrene, alphas-methylstyrene and their derivatives, or at least one cationic monomer or quaternary ammonium such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or at least one organofluorinated or organosilylated monomer, or a mixture of several of these monomers,
- d) possibly, at least one monomer having at least two ethylenic insaturations referred to as a crosslinking monomer,

the total of the proportions of components a), b), c) and d) being equal to 100%.

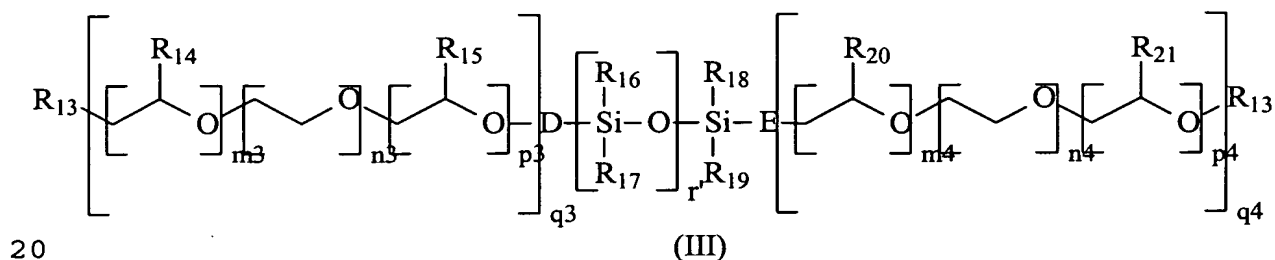
4- The use of a copolymer as agent improving the activation of optical brightness according to one of claims 1 to 3, characterized in that the organosilylated monomer is selected from among the molecules of formulae (IIa) or (IIb).



where

- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- A is a group which may be present, in which case it represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- B represents a hydrocarbon radical having from 1 to 4 carbon atoms or a mixture of several of said monomers,

and in that the crosslinking monomer is selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, the allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers prepared from polyols such as pentaerythritol, sorbitol, sucrose or selected from the molecules of formula (III):



where

- $m_3$ ,  $p_3$ ,  $m_4$  and  $p_4$  represent a number of alkylene oxide units less than or equal to 150,
- $n_3$  and  $n_4$  represent a number of ethylene oxide units less than or equal to 150,
- $q_3$  and  $q_4$  represent an integer equal to at least 1 and such that  $0 \leq (m_3+n_3+p_3)q_3 \leq 150$  and  $0 \leq (m_4+n_4+p_4)q_4 \leq 150$ ,
- $r'$  represents a number such that  $1 \leq r' \leq 200$ ,

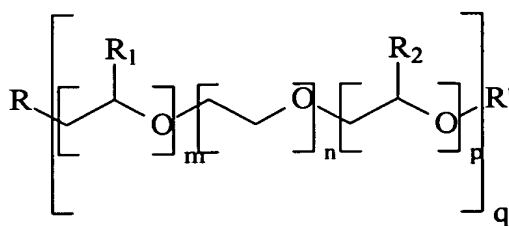
- $R_{13}$  represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
  - $R_{14}$ ,  $R_{15}$ ,  $R_{20}$  and  $R_{21}$  represent hydrogen or the methyl or ethyl radical,
  - $R_{16}$ ,  $R_{17}$ ,  $R_{18}$  and  $R_{19}$  represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof
  - D and E are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms
- or a mixture of several of said monomers,

5- The use of a water-soluble copolymer as agent improving the activation of optical brightness according to one of claims 1 to 4, characterized in that said copolymer consists, by weight, of:

- a) from 2% to 95% and more particularly from 5% to 90% of at least one ethylenically unsaturated anionic monomer having a monocarboxylic function selected from among the ethylenically unsaturated monomers having a monocarboxylic function such as acrylic or methacrylic acid or hemiesters of diacids such as  $C_1$  to  $C_4$  monoesters of maleic or itaconic acid, or mixtures thereof, or selected from among the ethylenically unsaturated monomers having a dicarboxylic function such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or anhydrides of carboxylic acids, such as maleic anhydride or selected from among the ethylenically unsaturated monomers having a sulfonic function such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinylsulfonic acid and styrenesulfonic acid or selected from among the ethylenically unsaturated monomers having a phosphoric function such as vinylphosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and their ethoxylates or selected from among the

ethylenically unsaturated monomers having a phosphonic function such as vinylphosphonic acid, or mixtures thereof,

- b) from 2 to 95% and, more particularly, from 5% to 90%, of at least one non-ionic ethylenically unsaturated monomer of formula (I):



(I)

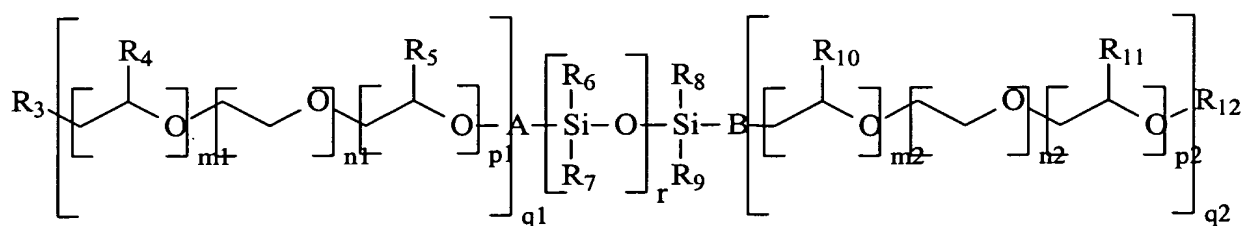
where

- m and p represent a number of alkylene oxide units less than or equal to 150,
- n represents a number of ethylene oxide units less than or equal to 150,
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- $\text{R}_1$  represents hydrogen or the methyl or ethyl radical,
- $\text{R}_2$  represents hydrogen or the methyl or ethyl radical,
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several monomers of formula (I),

- c) from 0% to 5% of at least one monomer of the acrylamide or methacrylamide type or their derivatives such as N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, and mixtures thereof, or at least one non water-soluble monomer such as the alkyl acrylates or methacrylates, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, vinyls such as vinyl acetate, vinylpyrrolidone, styrene, alphasubstituted styrene and their derivatives, or at least one cationic monomer or quaternary ammonium such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or at least one organofluorinated monomer, or at least one organosilylated monomer, selected preferably from among the molecules of formulae (IIa) or (IIb),

with formula (IIa)



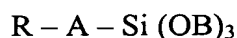
where

- $m_1$ ,  $p_1$ ,  $m_2$  and  $p_2$  represent a number of alkylene oxide units less than or equal to 150,
- $n_1$  and  $n_2$  represent a number of ethylene oxide units less than or equal to 150,
- $q_1$  and  $q_2$  represent an integer equal to at least 1 and such that  $0 \leq (m_1 + n_1 + p_1)q_1 \leq 150$  and  $0 \leq (m_2 + n_2 + p_2)q_2 \leq 150$ ,
- $r$  represents a number such that  $1 \leq r \leq 200$ ,



- $R_3$  represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- $R_4$ ,  $R_5$ ,  $R_{10}$  and  $R_{11}$  represent hydrogen or the methyl or ethyl radical,
- $R_6$ ,  $R_7$ ,  $R_8$  and  $R_9$  represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof,
- $R_{12}$  represents a hydrocarbon radical having from 1 to 40 carbon atoms,
- A and B are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

with formula (IIb)



where

- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
  - A is a group which may be present, in which case it represents a hydrocarbon radical having from 1 to 4 carbon atoms,
  - B represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- or a mixture of several of said monomers,

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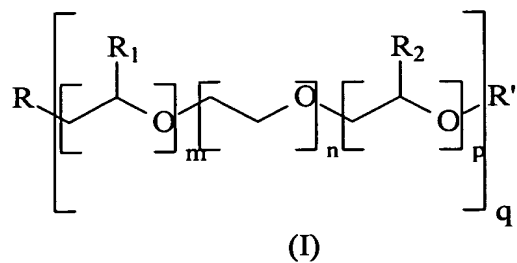
or a mixture of several of said monomers,

the total of the proportions of components a), b), c) and d) being equal to 100%.

- 5 6- The use of a water-soluble copolymer as agent improving the activation of optical brightness according to one of claims 1 to 5, characterized in that said copolymer is in its acid form or fully or partially neutralized by one or more neutralization agents having a monovalent neutralizing function or a polyvalent neutralizing function such as, for the monovalent function, those selected from among the group consisting of the  
10 alkaline cations, in particular sodium, potassium, lithium, ammonium or the primary, secondary or tertiary aliphatic and/or cyclic amines such as for example stearylamine, the ethanolamines (mono-, di-, triethanolamine), mono and diethylamine, cyclohexylamine, methylcyclohexylamine, aminomethylpropanol, morpholine or, for the polyvalent function, those selected from among the group consisting of alkaline  
15 earth divalent cations, in particular magnesium and calcium, or zinc, as for the trivalent cations, including in particular aluminium, or by certain cations of higher valency.

- 7- An agent improving activation of optical brightness, characterized in that it is a water-soluble copolymer having at least one alkoxy or hydroxy polyalkylene glycol  
20 function grafted onto at least one ethylenically unsaturated monomer.

- 8- An agent improving the activation of optical brightness according to claim 7 characterized in that it is a water-soluble copolymer consisting of at least one monomer of formula (I):



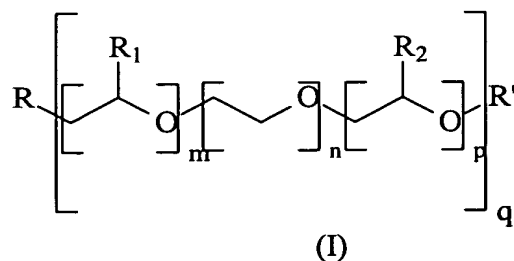
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where

- m and p represent a number of alkylene oxide units less than or equal to 150,
- n represents a number of ethylene oxide units less than or equal to 150,
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- $R_1$  represents hydrogen or the methyl or ethyl radical,
- $R_2$  represents hydrogen or the methyl or ethyl radical,
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms,

9- An agent improving the activation of optical brightness according to one of claims 7 or 8 characterized in that it is a water-soluble copolymer consisting of:

- a) at least one anionic monomer with a carboxylic or dicarboxylic or phosphoric or phosphonic or sulfonic function or a mixture thereof,
- b) at least one non-ionic monomer, the non-ionic monomer consisting of at least one monomer of formula (I):



where

- m and p represent a number of alkylene oxide units less than or equal to 150,

- n represents a number of ethylene oxide units less than or equal to 150,
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- R<sub>1</sub> represents hydrogen or the methyl or ethyl radical,
- 5      - R<sub>2</sub> represents hydrogen or the methyl or ethyl radical,
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$
- 10      dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- R' represents hydrogen or a hydrocarbon radical having from 1 to 40 carbon atoms, and preferably represents a hydrocarbon radical having
- 15      from 1 to 12 carbon atoms and even more preferably a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several monomers of formula (I),

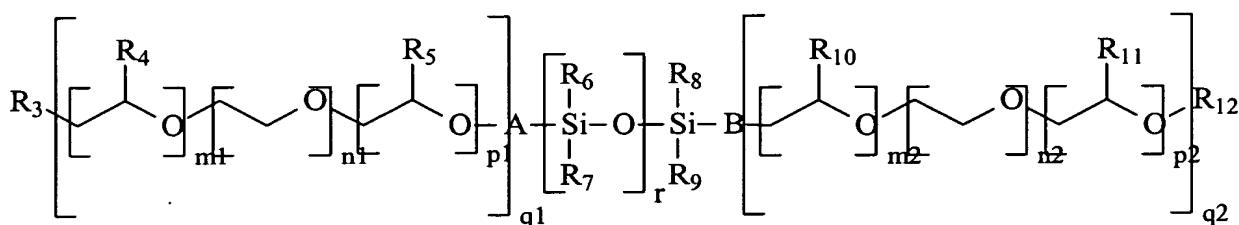
- 20      c) possibly, at least one monomer of the acrylamide or methacrylamide type or their derivatives such as N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, and mixtures thereof, or at least one non water-soluble monomer such as the alkyl acrylates or methacrylates, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-
- 25      (dimethylamino) ethyl] acrylate, vinyls such as vinyl acetate, vinylpyrrolidone, styrene, alphas-methylstyrene and their derivatives, or at least one cationic monomer or quaternary ammonium such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium
- 30      chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or at least one organofluorinated or organosilylated monomer, or a mixture of several of these monomers,

d) possibly, at least one monomer having at least two ethylenic insaturations referred to as a crosslinking monomer,

5 the total of the proportions of components a), b), c) and d) being equal to 100%.

10- An agent improving the activation of optical brightness according to one of claims 7 to 9 characterized in that the organosilylated monomer is selected from among the molecules of formulae (IIa) or (IIb).

10 with formula (IIa)

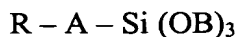


where

- $m_1$ ,  $p_1$ ,  $m_2$  and  $p_2$  represent a number of alkylene oxide units less than or equal to 150,
- 15 -  $n_1$  and  $n_2$  represent a number of ethylene oxide units less than or equal to 150,
- $q_1$  and  $q_2$  represent an integer equal to at least 1 and such that  $0 \leq (m_1 + n_1 + p_1)q_1 \leq 150$  and  $0 \leq (m_2 + n_2 + p_2)q_2 \leq 150$ ,
- $r$  represents a number such that  $1 \leq r \leq 200$ ,
- 20 -  $R_3$  represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- 25 -  $R_4$ ,  $R_5$ ,  $R_{10}$  and  $R_{11}$  represent hydrogen or the methyl or ethyl radical
- $R_6$ ,  $R_7$ ,  $R_8$  and  $R_9$  represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof

- $R_{12}$  represents a hydrocarbon radical having from 1 to 40 carbon atoms
- A and B are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms

5 with formula (IIb)



where

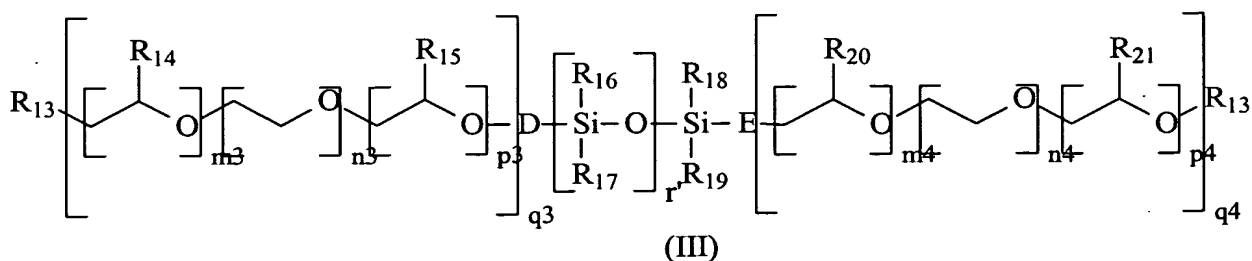
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphtalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- A is a group which may be present, in which case it represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- B represents a hydrocarbon radical having from 1 to 4 carbon atoms,

or a mixture of several of said monomers,

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and in that the crosslinking monomer is selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, the allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetraallyloxyethane, triallylcyanurates, allyl ethers prepared from polyols such as pentaerythritol, sorbitol, sucrose or selected from the molecules of formula (III):

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where

- $m_3$ ,  $p_3$ ,  $m_4$  and  $p_4$  represent a number of alkylene oxide units less than or equal to 150,
- $n_3$  and  $n_4$  represent a number of ethylene oxide units less than or equal to 150
- 5      -  $q_3$  and  $q_4$  represent an integer equal to at least 1 and such that  $0 \leq (m_3+n_3+p_3)q_3 \leq 150$  and  $0 \leq (m_4+n_4+p_4)q_4 \leq 150$ ,
- $r'$  represents a number such that  $1 \leq r' \leq 200$ ,
- $R_{13}$  represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- 10      -  $R_{14}$ ,  $R_{15}$ ,  $R_{20}$  and  $R_{21}$  represent hydrogen or the methyl or ethyl radical,
- $R_{16}$ ,  $R_{17}$ ,  $R_{18}$  and  $R_{19}$  represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof,
- D and E are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,
- 15      or a mixture of several of said monomers,
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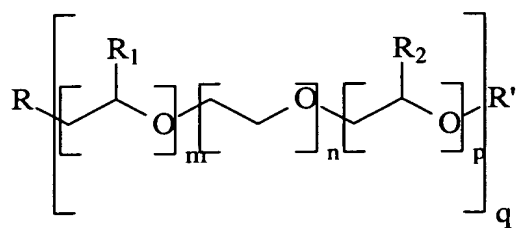
11- An agent improving the activation of optical brightness according to one of claims 7 to 10, characterized in that it is a water-soluble copolymer consisting, by weight, of:

- 25      a) from 2% to 95%, and more particularly from 5% to 90%, of at least one ethylenically unsaturated anionic monomer having a monocarboxylic function selected from among the ethylenically unsaturated monomers having a monocarboxylic function such as acrylic or methacrylic acid or hemiesters of diacids such as  $C_1$  to  $C_4$  monoesters of maleic or itaconic acid, or mixtures thereof, or selected from among the ethylenically unsaturated monomers having a dicarboxylic function such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or anhydrides of carboxylic acids, such as maleic anhydride or selected from among the ethylenically unsaturated monomers having a sulfonic function
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such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinylsulfonic acid and styrenesulfonic acid or selected from among the ethylenically unsaturated monomers having a phosphoric function such as vinylphosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and their ethoxylates or selected from among the ethylenically unsaturated monomers having a phosphonic function such as vinylphosphonic acid, or mixtures thereof,

- b) from 2 to 95% and, more particularly, from 5% to 90%, of at least one non-ionic ethylenically unsaturated monomer of formula (I):



(I)

where

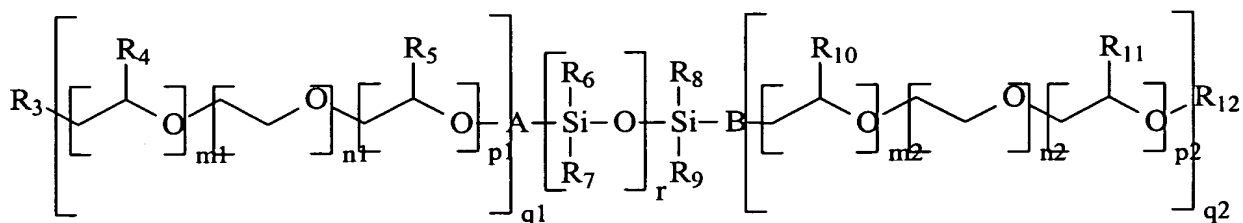
- m and p represent a number of alkylene oxide units less than or equal to 150,
- n represents a number of ethylene oxide units less than or equal to 150
- q represents an integer equal to at least 1 and such that  $5 \leq (m+n+p)q \leq 150$ , and preferably such that  $15 \leq (m+n+p)q \leq 120$ ,
- $\text{R}_1$  represents hydrogen or the methyl or ethyl radical,
- $\text{R}_2$  represents hydrogen or the methyl or ethyl radical,
- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group

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or a mixture of several monomers of formula (I),

- 10

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where

- $m_1$ ,  $p_1$ ,  $m_2$  and  $p_2$  represent a number of alkylene oxide units less than or equal to 150,

- $n_1$  and  $n_2$  represent a number of ethylene oxide units less than or equal to 150,
- $q_1$  and  $q_2$  represent an integer equal to at least 1 and such that  $0 \leq (m_1+n_1+p_1)q_1 \leq 150$  and  $0 \leq (m_2+n_2+p_2)q_2 \leq 150$ ,
- 5 -  $r$  represents a number such that  $1 \leq r \leq 200$ ,
- $R_3$  represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- 10 -  $R_4$ ,  $R_5$ ,  $R_{10}$  and  $R_{11}$  represent hydrogen or the methyl or ethyl radical,
- $R_6$ ,  $R_7$ ,  $R_8$  and  $R_9$  represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof,
- 15 -  $R_{12}$  represents a hydrocarbon radical having from 1 to 40 carbon atoms,
- A and B are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms,

20 with formula (IIb)

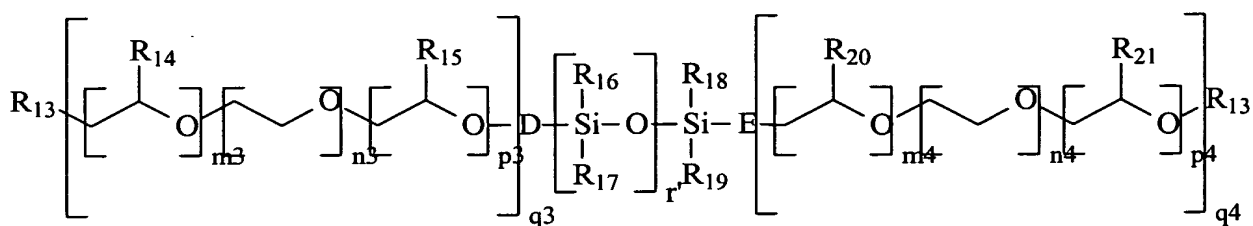


where

- R represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- 25 - A is a group which may be present, in which case it represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- B represents a hydrocarbon radical having from 1 to 4 carbon atoms,
- 30

or a mixture of several of said monomers,

- d) from 0% to 3% of at least one crosslinking monomer selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, the allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers prepared from polyols such as pentaerythritol, sorbitol, sucrose or others, or selected from the molecules of formula (III):



(III)

where

- $m_3$ ,  $p_3$ ,  $m_4$  and  $p_4$  represent a number of alkylene oxide units less than or equal to 150,
- $n_3$  and  $n_4$  represent a number of ethylene oxide units less than or equal to 150,
- $q_3$  and  $q_4$  represent an integer equal to at least 1 and such that  $0 \leq (m_3+n_3+p_3)q_3 \leq 150$  and  $0 \leq (m_4+n_4+p_4)q_4 \leq 150$ ,
- $r'$  represents a number such that  $1 \leq r' \leq 200$ ,
- $R_{13}$  represents a radical containing a polymerizable unsaturated function, belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, and vinylphthalic esters and to the group of urethane unsaturates such as acrylurethane, methacrylurethane,  $\alpha$ - $\alpha'$  dimethyl-isopropenyl-benzylurethane and allylurethane, and to the group of allyl or vinyl ethers, whether or not substituted, or to the group of ethylenically unsaturated amides or imides,
- $R_{14}$ ,  $R_{15}$ ,  $R_{20}$  and  $R_{21}$  represent hydrogen or the methyl or ethyl radical
- $R_{16}$ ,  $R_{17}$ ,  $R_{18}$  and  $R_{19}$  represent straight or branched alkyl, aryl, alkylaryl or arylalkyl groups having from 1 to 20 carbon atoms, or a mixture thereof

- D and E are groups which may be present, in which case they represent a hydrocarbon radical having from 1 to 4 carbon atoms or a mixture of several of said monomers,

5 the total of the proportions of components a), b), c) and d) being equal to 100%.

12- An agent improving the activation of optical brightness according to one of claims 7 to 11, characterized in that it is a copolymer in its acid form or fully or partially neutralized by one or more neutralization agents having a monovalent neutralizing  
10 function or a polyvalent neutralizing function such as, for the monovalent function, those selected from among the group consisting of the alkaline cations, in particular sodium, potassium, lithium, ammonium or the primary, secondary or tertiary aliphatic and/or cyclic amines such as stearylamine, the ethanolamines (mono-, di-, triethanolamine), mono and diethylamine, cyclohexylamine, methylcyclohexylamine,  
15 aminomethylpropanol, morpholine or, for the polyvalent function, those selected from among the group consisting of alkaline earth divalent cations, in particular magnesium and calcium, or zinc, and of the trivalent cations, including in particular aluminium, or of certain cations of higher valency.

20 13- A method for the dispersion in aqueous suspension of mineral matter characterized in that use is made of the copolymer according to one of the claims 1 to 6.

14- A method for the dispersion in aqueous suspension of mineral matter, according to claim 13, characterized in that use is made of 0.05% to 5% by dry weight of said  
25 copolymer with respect to the dry weight of the fillers and/or pigments, and, more particularly, in that use is made of 0.1% to 3% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

15- A method for the dispersion in aqueous suspension of mineral matter according to  
30 one of claims 13 or 14, characterized in that the mineral matter is selected from among calcium carbonate, dolomites, kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium carbonate-kaolin mixtures, or mixtures of calcium carbonate with aluminium trihydroxide, or mixtures with synthetic or natural fibres or co-structures of

minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and consists more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or mixtures thereof.

5 16- An aqueous suspension of mineral matter, characterized in that it contains the copolymer according to one of claims 1 to 6 and more particularly in that it contains 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and more particularly in that it contains 0.1% to 3% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

10 17- An aqueous suspension of mineral matter dispersed according to claim 16, characterized in that the mineral matter is selected from among calcium carbonate, dolomites, kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium  
15 carbonate-kaolin mixtures, or mixtures of calcium carbonate with aluminium trihydroxide, or mixtures with synthetic or natural fibres or co-structures of minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and consists more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or mixtures thereof.

20 18- A method for the grinding in aqueous suspension of mineral matter characterized in that use is made of the copolymer according to one of claims 1 to 6.

25 19- A method for the grinding in aqueous suspension of mineral matter, according to claim 18 characterized in that use is made of said 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and, more particularly, in that use is made of 0.1% to 3% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

30 20- A method for the grinding in aqueous suspension of mineral matter according to one of claims 18 or 19, characterized in that the mineral matter is selected from among calcium carbonate, dolomites, kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium carbonate-kaolin mixtures, or mixtures of calcium carbonate with

aluminium trihydroxide, or mixtures with synthetic or natural fibres or co-structures of minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and consists more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or mixtures thereof.

5

21- An aqueous suspension of ground mineral matter, characterized in that it contains the copolymer according to one of claims 1 to 6 and more particularly in that it contains 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and more particularly in that it contains 0.1% to 3% by  
10 dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

22- An aqueous suspension of ground mineral matter according to claim 21, characterized in that the mineral matter is selected from among calcium carbonate,  
15 dolomites, kaolin, talc, gypsum, titanium oxide, satin white or aluminium trihydroxide, mica and the mixture of these fillers, such as talc-calcium carbonate or calcium carbonate-kaolin mixtures, or mixtures of calcium carbonate with aluminium trihydroxide, or mixtures with synthetic or natural fibres or co-structures of minerals such as talc-calcium carbonate or talc-titanium dioxide co-structures, and consists  
20 more particularly of calcium carbonate such as natural calcium carbonate selected from among marble, calcite, chalk or mixtures thereof.

23- A method for the manufacture of filler characterized in that use is made of the copolymer according to one of the claims 1 to 6.

25

24- A method for the manufacture of filler according to claim 23, characterized in that use is made of from 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and, more particularly, in that use is made of 0.1% to 1% by dry weight of said copolymer with respect to the dry weight of the  
30 fillers and/or pigments.

25- A filler characterized in that it contains the copolymer according to one any of claims 1 to 6 and more particularly in that it contains from 0.05% to 5% by dry weight of said copolymer with respect to the total dry weight of the fillers and/or pigments,

and more particularly in that it contains 0.1% to 1% by dry weight of said copolymer with respect to the total dry weight of the fillers and/or pigments.

5 26- A method for the manufacture of coating colour, characterized in that use is made of the copolymer according to one of claims 1 to 6.

10 27- A method for the manufacture of coating colour according to claim 26, characterized in that use is made of from 0.05% to 5% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments, and, more particularly, in that use is made of from 0.1% to 2% by dry weight of said copolymer with respect to the dry weight of the fillers and/or pigments.

15 28- A coating colour characterized in that it contains the copolymer according to one of claims 1 to 6 and more particularly in that it contains from 0.05% to 5% by dry weight of said copolymer with respect to the total dry weight of the fillers and/or pigments, and more particularly in that 0.1% to 2% by dry weight of said copolymer with respect to the total dry weight of the fillers and/or pigments.

20 29- The use of a copolymer according to any one of claims 1 to 6 as additive added to suspensions of dispersed mineral matter .

30- The use of a copolymer according to any one of claims 1 to 6 as additive added to suspensions of ground mineral matter .

25 31- A manufactured and/or coated paper, characterized in that it contains the copolymer according to one of claims 1 to 6.

30 32- A textile composition, characterized in that it contains the copolymer according to one of claims 1 to 6.

33- A detergent composition, characterized in that it contains the copolymer according to one of claims 1 to 6.



34- A composition of paint, characterized in that it contains the copolymer according to one of claims 1 to 6.